

Using the WWW in Learning and Teaching

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This is leaflet 1 of a series written by members of the LTSN Generic Centre and ALT to inform their members on current learning technology topics.

Introduction

The World Wide Web started by scientific researchers in the early 90s with the creation of the Hyper Text Mark-up Language (HTML) – the format in which web pages are written – in order to share information across an incipient network of computer networks, known as the Internet¹. Since then, the WWW has become a pervasive means of communication and distribution of information and knowledge via the Internet.

This document intends to provide a brief introduction to the potential and current use of the WWW in tertiary education to deliver and support learning and teaching activities over the educational network. References and further resources are provided at the end of the document for further exploration of key issues.

How can the WWW support learning and teaching?

Increasing access to resources

The WWW can be used as an archive of course-related materials and resources, facilitating access to it by students and tutors anytime, anywhere. Usually such materials are placed within the institution's Intranet so that they are only available to registered students, but in some cases they are freely available world wide on the Internet. Course-related resources typically include:

- **Course information:** details such as tutors, groups, timetables, reading lists, assessment information
- **Teaching materials:** slides, handouts, lecture notes, short topic tutorials, paper extracts and other material used in lectures or seminars, such as assessment samples or student work
- **Links to related materials and WWW resources:** either within the Institution (such as links to Library collections) or outside.

Course-related resources usually consist of a combination of text, images, sound and video, and are often created by tutors themselves, either as web pages or as files in their original electronic format linked to an appropriate web page (usually the course home page). The focus of such resources is mainly delivery of information about the course and its subject matter; interaction with

students is generally limited to email links or indication of other means of communication such as phone numbers or office hours.

HTML is the language used to create web pages. HTML 4 is the current standard². Many commercial programmes known as web editors (or web editing and management software) allow users to create web pages without having to learn HTML³ and most generic applications can also be used to produce HTML versions of a document. However, some knowledge of how the web works, elementary HTML syntax, and web site management principles is essential to produce good quality web resources beyond a few single web pages. HTML files can also contain links to other types of files including word-processed files, spreadsheets, presentation slides, etc.

In order to provide interactive course related resources, more sophisticated materials are required, often in a multimedia format requiring different levels of programming skills and additional applications known as plug-ins. This has been the subject of earlier phases of the Teaching and Learning Technology Programme⁴. Such material is known as courseware and can contain simulations, animations, activities to be carried out by students online and, in some cases, automatic assessment.

Whether making lecture notes available or creating a web-based tutorial to deal with a particularly difficult part of the syllabus, web-based course resources can help to meet specific needs of students if designed and used appropriately. Sound instructional design will involve analysing the learning needs to be addressed by those resources, and the ways in which these will be met. One scenario may be to provide lecture notes and reference material to part-time students

that cannot easily and regularly access library resources or attend all lectures.

Access to such resources is a very important issue. From September 2002 educational courses must comply with the Disability Discrimination Act. A national advisory service, TechDis, offers advice and information on the role of technology and disabilities⁵. Jakob Nielsen's web site⁶ is a good starting point on web usability.

Improving communication and supporting collaborative work

Web-based communication systems, or Computer Mediated Communication (CMC) can encourage student participation, improve student-student and student-tutor interaction and facilitate independent learning and peer learning. Web-based communication tools are also an excellent means of supporting group work, project work and reflective tasks. For a more detailed discussion of CMC and its uses, see the LTSN starter guide number 3 on CMC.

Email, newsgroups and mailing lists

Email is still the most appropriate means of CMC for individual communication, but it becomes less effective for group communication. Newsgroups and mailing lists are ideal for disseminating information to a group, but their uptake is limited by the lack of flexibility to manage messages and threads (discussions). Some mailing list systems now have web-based interfaces and archives, such as the UK academic mailing list service, JISCmail⁷. Find out about newsgroups and mailing lists in your institution.

Web-based discussion tools

Also known as Bulletin or Discussion Boards, the main advantage is that they produce a permanent, structured record of the discussion or activity that has taken place. Discussion boards allow tutors to organise and structure the discussion/s, thus being able to guide their students in their learning. They are particularly useful for discursive subjects (most humanities and some social sciences) and are very effective as a peer support mechanism.

Evaluation and assessment

The WWW presents great potential to support student evaluation and assessment of student learning, both for formative and increasingly also for summative purposes. A very simple form of computer-aided assessment could be the submission of essays by email and the marking and feedback to students by their tutors using current word processing correction and comment facilities.

They can also be used to support project and group work by facilitating exchange and sharing of documents between the whole group or project subgroups. Synchronous communication tools or Chat can also be used as "virtual office hours", for tutorial support, and revision purposes⁸.

Web-based video conferencing

Still in early development for education, these tools can facilitate tutorial support in real time or be used to invite "external experts" into a session. A web camera is needed, and a limited number of people from each location can participate in the session. Information on videoconferencing projects is available from the Learning Technology Dissemination Initiative (LTDI) and the JISC Technology Applications Programme web sites⁹. The Click and Go Video¹⁰ web site is also worth a visit.

Other networked tools

Relatively new tools, such as MicrosoftTM NetMeeting, are now available which allow a combination of audio, video and computer interaction in real time. Many institutions are reluctant to allow extensive use of such tools for reasons related to network security. Such tools allow remote audiences to work collaboratively on the same documents in real time, whilst talking to and seeing each other via the computer. Check your institution's policy on the use of application sharing software such as NetMeeting.

Course evaluation and student feedback

Web questionnaires, also known as web forms, can be used to carry course evaluation exercises and informal gathering of student feedback. Web forms are relatively easy to create, but automatic handling of data collected is a more complex operation. Dedicated tools are starting to appear to make this process easier; the Flashlight project is an example of this. When using the WWW to

collect information containing personal data, make sure you are familiar with recent Data Protection legislation. The Joint Information Systems Committee (JISC) have recently published a Data Protection Code of Practice for FE and HE¹².

Online assessment

Traditionally CAA has been most effective in assessing factual knowledge via multiple choice questions, and particularly as an aid to student

self-assessment. More sophisticated tools now exist that facilitate different forms of exercises and tasks, including matching different elements, typing short answers, or working with numbers and calculations. Used appropriately, such tools can help alleviate heavy marking loads and make assessment more interesting to students. For a more detailed discussion of CAA see LTSN starter guide number 4.

Web-based learning environments

These systems are often referred to as Virtual Learning Environments (VLEs) or Managed Learning Environments (MLEs), depending on whether they provide administrative tools such as student records and student management facilities, and their degree of interoperability with other institutional Management Information Systems (MIS).

Learning environments allow for a combination of course related materials, communication, assessment, and administration tools to be provided and used within a single environment via the web browser. Their most common features include:

- Diary and Calendar
- Course Content
- Communications: email, bulletin board, synchronous tools (chat)
- Assessment
- Student management: records, tracking, statistics.

Access to the Learning Environment is restricted by username and password and will typically be organised by course or module. Most institutions are currently supporting and using one or more such systems, some have developed their own. The market leaders in higher education at present are Blackboard and WebCT. The JISC Managed Learning Environments web site¹³ provides a good source of information. See also LTSN starter guide number 2 on VLEs.

Advantages and disadvantages

The WWW and its applications are mere instruments without any intrinsic educational value. Their effectiveness as educational tools relies on the use that is made of them, both by educators and by students.

Perhaps the greatest advantage of using the WWW is the ability to link resources in many different formats (text, images, sound and video), making this a very **rich** and **powerful** medium. Such resources are then available without any restrictions of **time** or **location**, making the WWW a medium with great potential for distance and flexible learning, but also for **widening access** and supporting students in traditional courses, such as part-time, mature, or work-based

students. However, **access** to appropriate computer equipment can still be a problem for educators and students alike if the necessary infrastructure is not available or is unaffordable by themselves or their institutions.

By facilitating more flexible access to learning resources, using the WWW can encourage students to take a more active role and become more independent learners. But even independent student learning needs to be guided and supported, either by access to tutors or implicitly through the organisation and design of the resources. Appropriate **induction** and **ongoing support** are essential for effective learning to happen.

Getting started

The previous sections offer a very brief overview of the potential and current use of the WWW in education. You may be familiar with some or all of the tools and strategies mentioned above, or you may wish to get started using some of these tools or developing the use of a particular tool further.

Here are some practical tips to help you get started:

- Think of the educational purpose of your project. What do you intend your students to learn? How? What are your intended learning outcomes?
- Explore and review the tools available and any information on their use and effectiveness so you can choose the most appropriate tool for the purpose.
- Find out what is available in your institution in terms of information, advice, support, resources and tools that you may be able to use and existing expertise by other

colleagues or support services. It is essential that you discuss your plans with colleagues and services to avoid duplication of efforts and to make the most of your work. You may also wish to contact your appropriate LTSN centre¹⁴.

- Plan your project taking account of existing resources, further resources needed and ongoing maintenance costs after initial development. Make allowances for the time required to develop or redevelop materials, as this is easily underestimated. Plan for evaluation of your project from the beginning: what do you wish to (or need to) evaluate? How will you know if your project has been successful and effective? Think also of possible dissemination of your experience, any results or lessons learnt that may be useful to others.

References and resources

¹ www.w3.org/MarkUp/#historical

² www.w3.org/MarkUp/

³ For example Microsoft™ Front Page or Macromedia™ Dreamweaver. See www.builder.com

⁴ For details of phases 1 and 2 of the TLTP see www.ncteam.ac.uk/

⁵ Technologies for Disabilities Information Centre www.techdis.ac.uk/
Also worth visiting the Web Accessibility Initiative www.w3.org/WAI/
and CAST Bobby www.cast.org/bobby/

⁶ www.useit.com/

⁷ www.jiscmail.ac.uk/

⁸ More on CMC from the Online Tutoring Skills (OTiS) project <http://otis.scotcit.ac.uk/>
and Gilly Salmon's web site obs.open.ac.uk/e-moderating/

⁹ LTDI <http://www.icbl.hw.ac.uk/ltidi> and JTAP www.jtap.ac.uk/

¹⁰ www.clickandgovideo.ac.uk/

¹¹ www.ctl.wsu.edu/CTLSilhouette/

¹¹ www.jisc.ac.uk/pub00/dp_code.html

¹³ www.jisc.ac.uk/mle/

¹⁴ www.ltsn.ac.uk

Other useful resources:

JISCmail discussion lists:

teaching-on-line@jiscmail.ac.uk

networked-learning@jiscmail.ac.uk

RDN Virtual Training Suite: www.vts.rdn.ac.uk/

Effective Networked Learning in Higher Education: notes and guidelines. CSALT (2000); available from csalt.lancs.ac.uk/jisc/advice.htm

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Alexander, S. (1998), *An evaluation of Information Technology Projects for University Learning*, CUTSD, National Capital Printing, Canberra.

Acknowledgements

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